1. **COURSE TITLE\*:** Organic Chemistry Lab II
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*:** CHEM 2212
3. **PREREQUISITE(S)\*:** CHEM 2201 & 2211

**COREQUISITE(S)\*:** CHEM 2202

1. **COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**
2. **CREDIT HOURS\*:** 1 **LECTURE HOURS\*:** 0

**LABORATORY HOURS\*:** 3 contact hours **OBSERVATION HOURS\*:** 0

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

A course designed to give the student hands-on laboratory experience with the concepts of Organic Chemistry 2202 and the use of experimental apparatuses and techniques in the practice of organic chemistry. Emphasis will be on microscale technique due to its safety and economy of time and resources as well as its frequent need in biochemical, natural product, environmental and pharmaceutical fields; however, some macroscale experiments may be performed. Experiments will generally cover experimentally the concepts studied in Organic Chemistry 2202 including Friedel-Crafts, nitration, and other electrophilic substitution reactions of the aromatic ring; oxidation of alcohols; epoxidation of alkenes; preparation and reaction of organometallic compounds; the aldol condensation; and infrared and un/visible spectrophotometry formation and reaction of carboxylic acids and their derivatives; amines; phenols; versatile synthetic techniques such as the acetoacetic ester and malonic ester syntheses and aromatic diazonium salt reactions; carbohydrates; lipids; and proteins and other polymers.

1. **LEARNING OUTCOMES\*:**

Upon completion of this course the student should be able to:

1. Visualize the interconversions among various classes of compounds such as alcohols, aldehydes and ketones via oxidation and reduction, and have a general idea of the reagents and conditions to effect these interconversions.
2. Understand the basic concepts of and the actual experimental procedures out electrophilic aromatic substitutions of aromatic compounds, including Friedel-Crafts alkylations and acylations, nitrations, and halogenations.
3. Understand nucleophilic addition to the carbonyl group and how it is used synthetically in the aldol condensation and other reactions.
4. Understand and perform conversions of carboxylic acids and their derivatives into more stable derivatives of those compounds.
5. Synthesize a variety of esters by several techniques, including the Fischer esterification.
6. Understand the basic concepts of and the actual experimental procedures to carry out a malonic ester or acetoacetic ester synthesis and the further reactions possible to form various acids and substituted barbiturates.
7. Conduct a Grignard synthesis of an alcohol.
8. Understand and use the various types of aldol and Claisen condensations.
9. Use chemical properties to separate ingredients of a complex mixture.
10. Test for different types of carbohydrates and understand the chemistry of the tests.
11. Perform catalytic hydrogenation of an unsaturated vegetable oil and hydrolyze it to its constituent fatty acids.
12. Differentiate between monomers and polymers, including amino acids and proteins, and understand how they are related experimentally
13. **ADOPTED TEXT(S)\*:**

*Macroscale and Microscale Organic Experiment*, 7th Edition

By: Kenneth L. Williamson

Cengage, 2016

ISBN: 978-1-305-57719-0

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.)\*\***

Safety goggles (laboratory fume hoods, aprons, gloves, and any other necessary personal protective equipment will be supplied). Laboratory equipment and chemicals will be supplied in the class.

1. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

A: 90 – 100

B: 80 – 89

C: 70 – 79

D: 60 – 69

F: 0 – 59

1. **GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***
2. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

**14. COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

***(Insert sample course outline with learning objectives tied to assignments / topics.)***

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

Students who exhibit behavior that is disruptive to the learning process will after a verbal warning be dismissed from the class.

In the laboratory, students are required to follow all safety rules and procedures specified by the instructor. Anyone not working quietly and safely will be asked to leave and will receive a zero for that day's lab assignment.

**16. FERPA:\***

Students need to understand that your work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**17. DISABILITIES:\***

Students with disabilities may contact the Disability Services Office, Central Campus, at 800-628-7722 or 937-393-3431.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.